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(12) UK Patent Application (19) GB (11) 2 281 928 (13) A

(43) Date of A Publication 22.03.1995

(21) Application No 9418193.0

(22) Date of Filing 09.09.1994

(30) Priority Data

(31) 9318746

(32) 09.09.1993

(33) GB

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(51) INT CL⁶

E02D 29/14 , E01C 9/08

(52) UK CL (Edition N)

E1G G94L G94X G96L G96X

(56) Documents Cited

GB 2267106 A GB 2265649 A GB 2238815 A

GB 1249914 A

WPI Abstract Accession No.82-C2084E/09 &

DE 3028805 A

(58) Field of Search

UK CL (Edition M) E1G

INT CL⁵ E01C 9/08 , E02D 29/14 , E03F 5/06

ONLINE DATABASES: WPI

(54) Temporary trench cover

(57) Platform assemblies for providing temporary covering of trenches or holes, e.g. in roads or pavements, comprise a deck and attachment means for releasably retaining the deck in the required position. In one embodiment, channels 16 on a lower surface of the deck 10 receive fixings for releasably securing a bar 12. The bar 12 may be moved with respect to the deck 10 to drive ends of the bar 12 into respective side walls of the trench. In an alternative embodiment (Fig. 5) depending framework elements are provided at each end of the deck and which are clamped against the side walls of the trench. In a further embodiment (Fig. 6) the deck is in the form of a collapsible lattice having attachment strips which extend beyond the edges of the trench. The strips are bonded to the road surface with a thermosetting resin. Also disclosed is an anchor arrangement (Fig. 7) for retaining the deck in position.

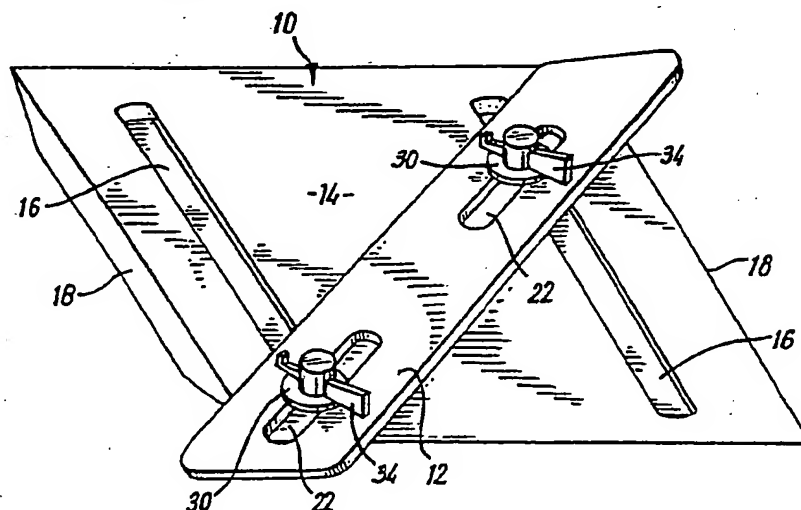


FIG 1

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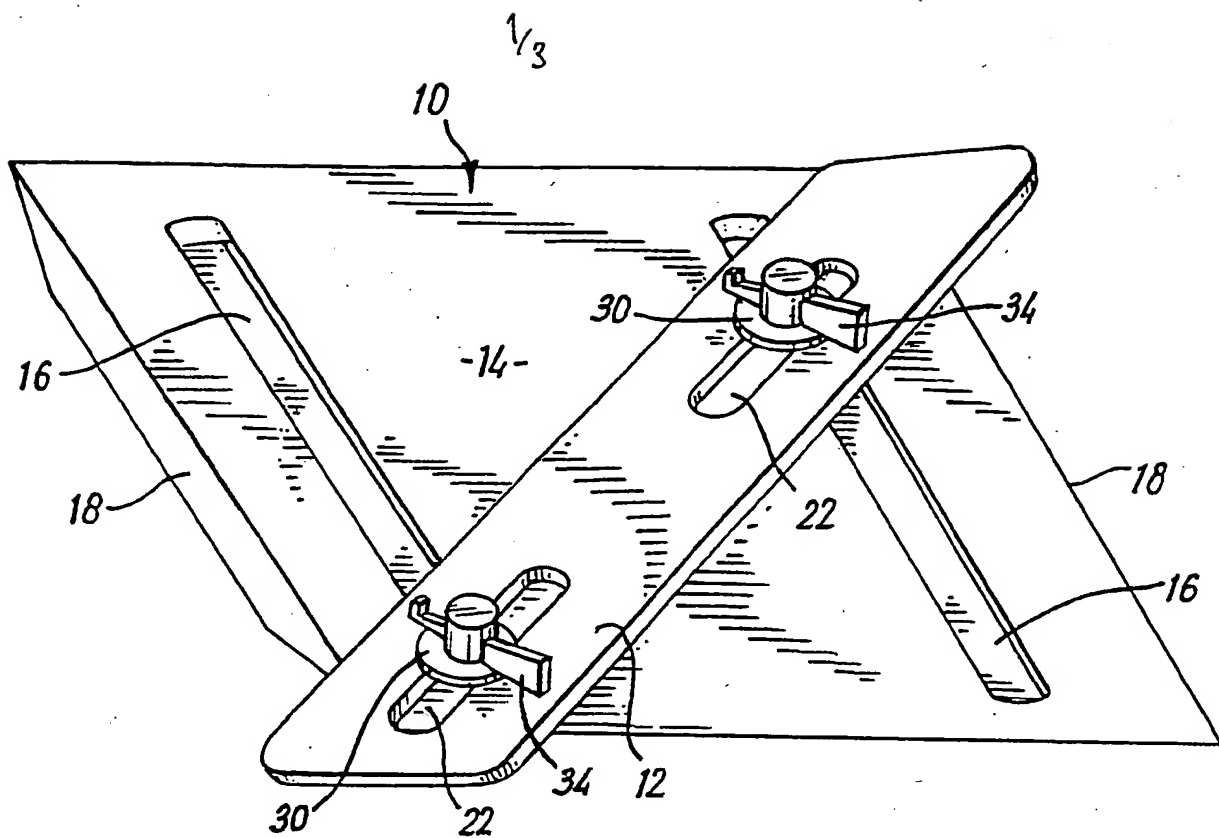


FIG. 1

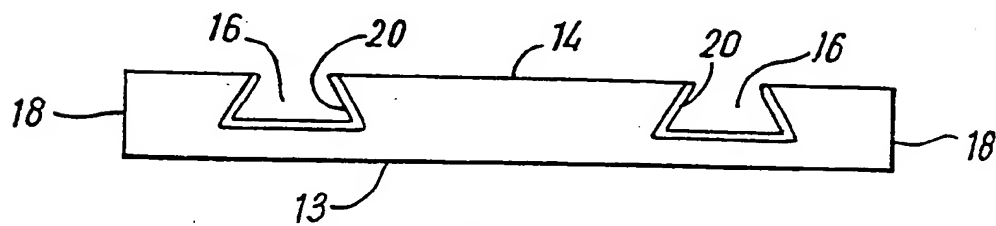


FIG. 2

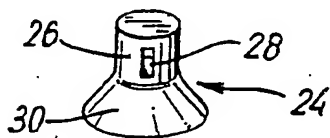
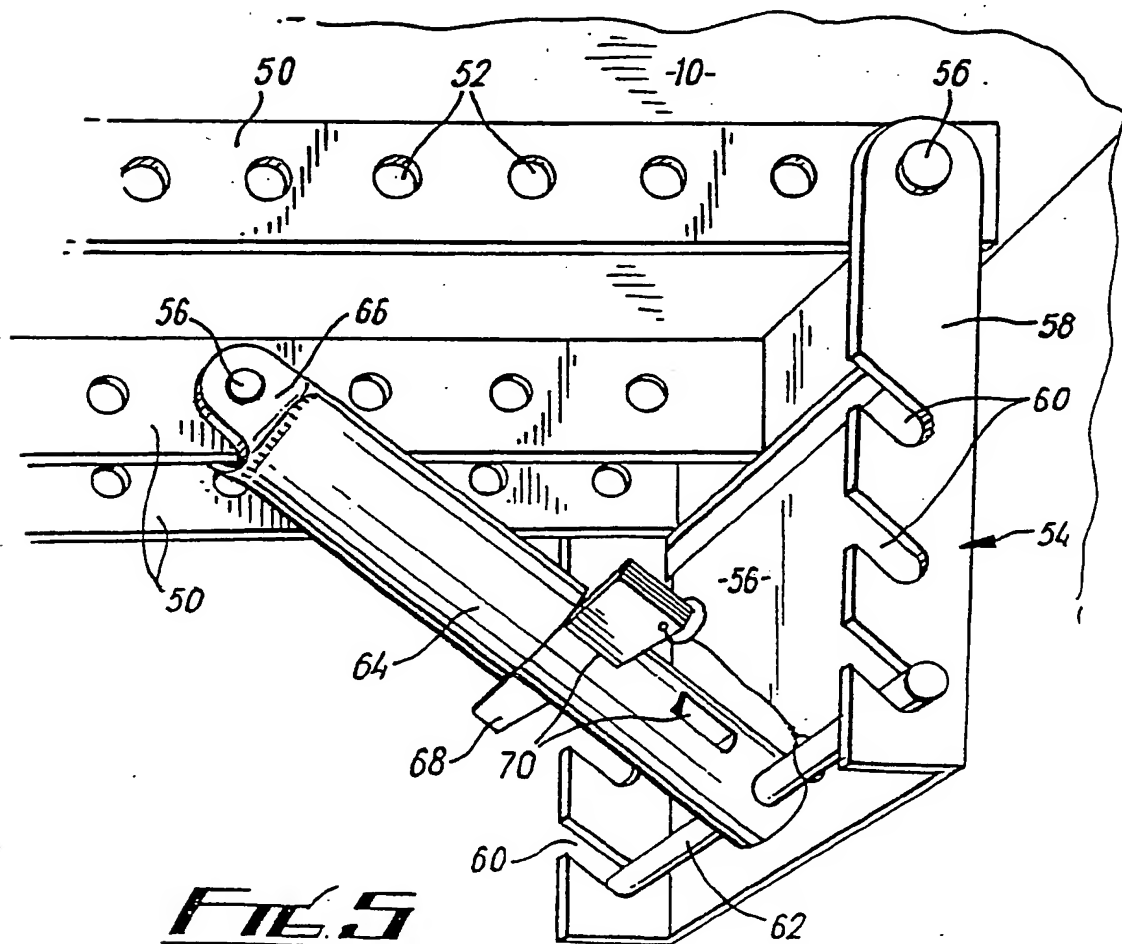
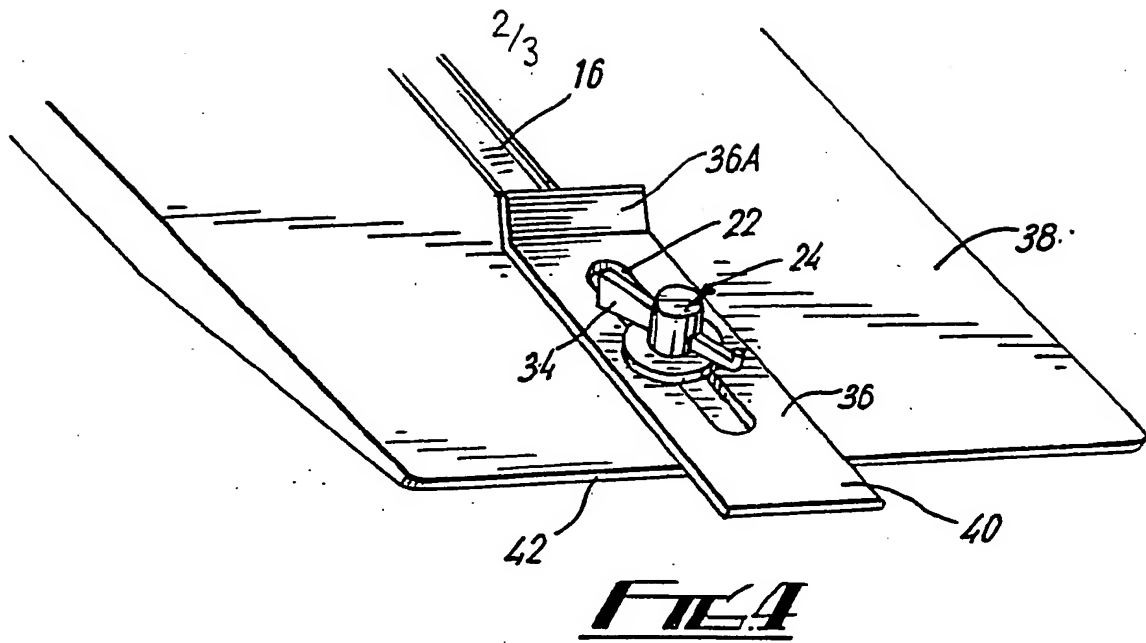
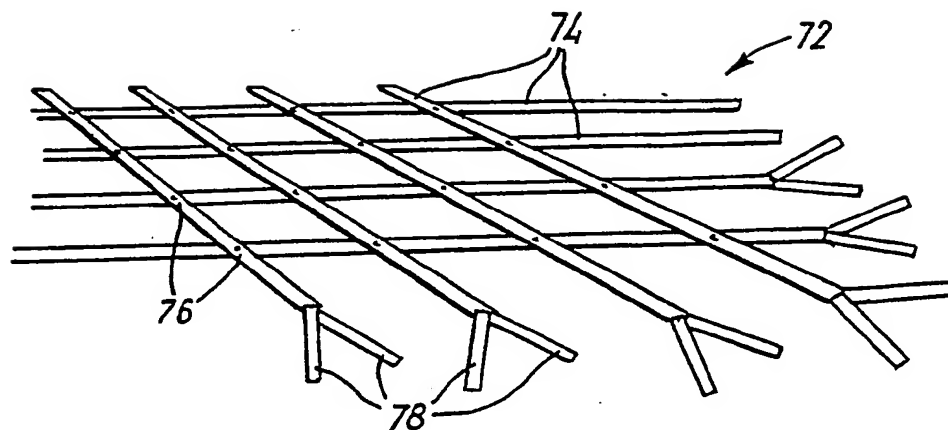
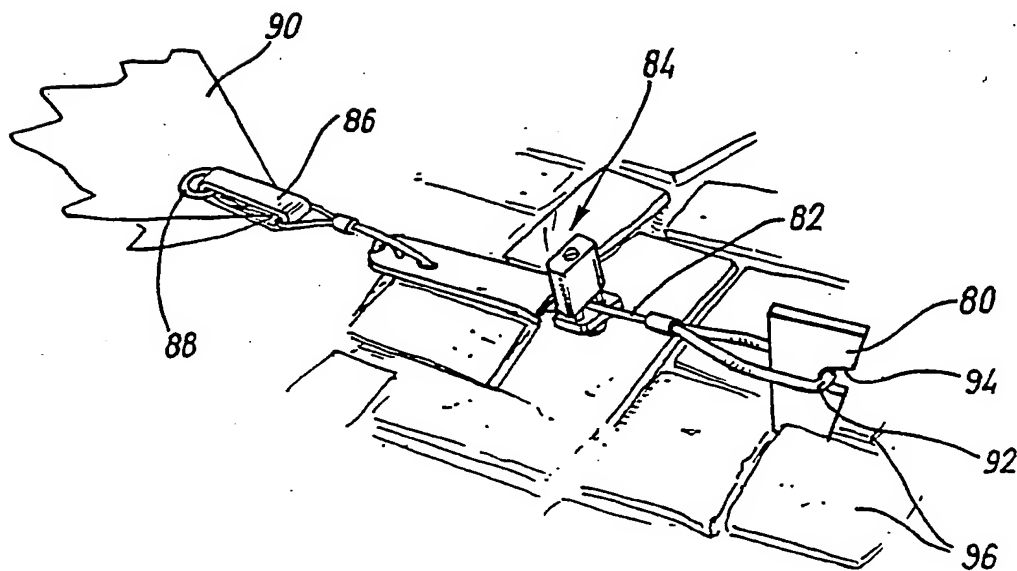


FIG. 3



$\frac{3}{3}$ 

FTE.6



FTE. 7

Platform Assembly

The present invention concerns a platform assembly for use in covering a trench or hole.

Trenches, channels or holes are often temporarily dug in pavements, roads and other public places, for example to enable the installation, repair or maintenance of underground pipework. Where pavements or the like are involved it is frequently necessary to provide a temporary covering over at least part of the trench for members of the public to walk upon. Similarly, it is occasionally necessary to provide a covering over which vehicles may pass.

It has previously been common practice simply to lay steel plates or wooden boards to extend across the trench opening and provide such temporary covering. However, although steel plates give good strength they are relatively heavy to manipulate, and can become very slippery when wet. In addition, problems are encountered in retaining the original location of the plate, due to flexing. The plate may be fixed into position with a tar-based road covering material or with metal stakes driven into the ground. However, neither of these methods is wholly effective and the use of the

stakes creates holes in the road which will quickly deteriorate and crack. Wooden boards are lighter, but are more fragile and prone to splintering and warping.

The present invention seeks to mitigate or obviate these and other difficulties associated with existing coverings.

The term "trench" when used in the present specification is intended also to refer to an open channel or hole in a pavement, path, road or similar.

According to the invention there is provided a platform assembly for covering a trench, the assembly comprising means providing a deck and attachment means permitting releasable retention of the deck means on the trench in a required position.

The assembly may be collapsible to facilitate storage when not in use.

The deck means is preferably at least one board. The or each board may be formed from a lightweight polymeric material. Each board may be reinforced. The deck means may be provided with a non-slip surface. Preferably the thickness of the deck means is tapered at each edge of the deck.

Alternatively, the deck means may comprise a lattice or trellis arrangement. Preferably there is provided a lattice of bars pivotally interconnected so as to permit closing of the lattice when not in use. The bars may be of metal, and may be resin coated to add strength and/or to add surface colour for increased visibility.

The attachment means may comprise one or more projecting peg arrangement drivable into a respective wall of the trench. The peg arrangement may be removable. Preferably the peg arrangement extends laterally from the deck means. The location of the peg arrangement on the deck means may be adjustable. There may be provided an open channel on the deck means and a slot in the peg arrangement, fastening means for the peg arrangement being slidably engageable in the channel through the slot. Preferably there is provided a pair of spaced channels and fastening means associated with each channel cooperating with a respective slot on the peg arrangement. The deck means may be adapted for the attachment to a surface thereof of one or more bracing rods. At least one end of the or each rod may project beyond the periphery of the deck means to define the projecting peg.

In an alternative embodiment, the attachment means

may comprise means for clamping the deck means to walls of the trench. Preferably the clamping means spreads a load placed on the deck means to the side walls of the trench. Preferably the clamping means permits adjustment to enable it to be used for varying sizes of trench. The clamping means is preferably pivotally mounted relative to the deck, and preferably means is provided for urging the clamping means against side walls of the trench. The urging means preferably acts between the deck and the clamping means, and is preferably adjustable. The urging means may comprise a telescopically-extendable rod and means for securing the rod in a selected position. The securing means may comprise a wedge locatable through a slot in an inner part of the rod.

The attachment means may in a further alternative comprise at least one attachment member. There may be provided attachment members extending from the deck means to extend beyond the trench on at least two substantially opposite sides thereof. The attachment members are preferably flexible. The attachment members may comprise attachment strips, which may be formed from a plastics material. Preferably each of a plurality of attachment points on the deck means is provided with two attachment strips diverging in a V configuration from the attachment point substantially in the plane of the

deck means. The attachment surface may be releasably attachable to ground adjacent the mouth of the trench. Resin is preferably provided for the attachment. Preferably the resin has non-slumping properties, and may be a thermosetting polyurethane-based resin.

In a yet further alternative, the attachment means may comprise a releasable anchor arrangement. The anchor arrangement may comprise an anchor and a tie. Preferably one end of the tie is attached to the deck means, and the other end is secured to the ground adjacent the mouth of the trench by means of the anchor. The tie preferably comprises a wire, and the anchor arrangement preferably includes a tensioning arrangement for the wire. The tensioning arrangement preferably comprises a lockable lever. The wire may be attached to the deck means by a strap which may locate in a through aperture in the deck means. The anchor is preferably a wedge, and may be drivable into a gap between paving slabs or underneath the surface layer of concrete.

The attachment means may yet further comprise at least one expanding bolt locatable in a through aperture in the deck means.

The invention will be further described with reference to the accompanying drawings in which:-

Fig. 1 is a simplified perspective view from below of a platform assembly according to the invention;

Fig. 2 is a diagrammatic cross section of the deck of the assembly of Fig 1;

Fig. 3 is a perspective view of the fixing used in the assembly of Fig. 1;

Fig. 4 is a partial perspective view of a modified assembly similar to Fig. 1;

Fig. 5 is a partial perspective view of a further platform assembly according to the invention;

Fig. 6 is a simplified perspective view of a third platform assembly according to the invention; and

Fig. 7 is a simplified partial perspective view of an alternative attachment arrangement for a platform.

Referring to Figs. 1 to 3, there is shown a platform assembly comprising a deck 10 and a bracing bar 12. The deck 10 is formed from a lightweight semi-rigid polymeric material, and comprises a rigid outer casing filled with a lightweight foam packing material. An upper surface 13 of the deck 10 (not shown in Fig. 1) is provided with a non-slip surface coating. A lower surface 14 of the deck is provided with two parallel open channels 16, each running adjacent to a respective edge 18 of the deck 10. As is best shown in Fig. 2, each channel 16 is undercut so that the mouth thereof is narrower than the base. Each channel 16 has an internal

surface formed by a mild steel strengthening rib 20 having a complementary profile. The deck 10 is manufactured with the rib 20 bonded within the underside thereof. Each rib 20 provides reinforcement to the deck 10 and also provides means for locating the bracing bar 12 as will be described hereinafter. The deck 10 is initially manufactured so that each channel 16 extends along the entire length of the lower surface 14 thereof.

Fig. 3 shows a fixing 24 for use with the deck 10. The fixing comprises an upper portion 26 having a through aperture 28, and a flared lower portion 30. The fixing 24 is configured to permit the lower portion 30 to be inserted into an open end of one of the channels 16, the fixing subsequently being retained within the channel by retention of the flared portion 30 within the narrow mouth of the channel. When one of the fixings 24 has been inserted into each of the channels 16 of the deck 10, the respective open ends of the channel may be filled with a suitable sealant, to form the arrangement shown in Fig. 1 where the channels 16 each have closed ends, with one of the fixings 24 retained in each channel.

The bracing bar 12 is provided with a pair of spaced longitudinal slots 22 as shown in Fig. 1. The bar is fitted to the deck 10 on site. With the fixings

24 in required positions, adjacent opposite ends of the respective one of the slots as shown in Fig. 1, the upper portion 26 of each respective fixing is pushed through a respective one of the slots 22 on the bar 12, as shown. It will be noted that each end of the bracing bar 12 extends beyond the respective edge 18 of the deck 10. The deck 10 is then positioned in the trench. To secure it in position, the bar 12 is rotated in a clockwise direction as shown in Fig. 1 by sliding of the fixings 24 in channels 16, whereby to drive ends of the bar 12 into respective side walls of the trench. To lock the position of the bracing bar, a washer 30 is firstly placed over the exposed part of each fixing 24, and then a locking wedge 34 is fitted through each aperture 28.

Fig. 4 shows a modified arrangement of the assembly shown in Fig. 1 for use in situations where a less robust platform assembly is being used. In place of the bracing bar 12, this arrangement uses a short attaching bar 36 which is attachable by means of the fixing 24 and wedge 34 to a channel 16 in a lightweight board 38. In this arrangement, the attaching bar 36 is mounted so that an end 40 thereof projects substantially at right angles to an end edge 42 of the board 38. The end 40 may then be driven into a side wall of the trench by application of pressure to an upstand 36A of bar 36,

and the fixing 24 secured.

Fig. 5 shows an alternative platform assembly of the invention suitable for use where the assembly must withstand heavier traffic. In this embodiment a plurality of spaced, parallel steel framework elements 50 are mounted on the underside of the deck 10. Each element 50 is provided with a series of apertures at regular intervals therealong. The apertures 52 are provided for the selective fixing of steel frameworks 54, each of which is attached to spaced ones of the elements 50 by means of pegs 56 through respective apertures 52. Each framework 54 thereby forms a side panel which is pivotally suspended substantially at right angles to the elements 50, and which lies adjacent to a respective side wall of a trench over which the platform assembly is to be mounted. Each framework 54 is provided with inwardly projecting side panels 58, each having a number of open-ended, upwardly angled slots 60. The latter provide for the mounting of a rod 62 which extends through a first inner section of a telescopic bracing rod 64. The free end of the outer section of the latter is forked to locate over a respective one of the elements 50 and be pivotally connected thereto by a further peg 56 in the respective aperture 52. The bracing rod 64 is telescopically extendable so that it may be adjusted to a required length to permit

attachment between the element 50 and the framework 54. In the arrangement shown in Fig. 5, the rod 64 is locked at the appropriate length by means of a wedge 68 inserted in a selected one of a series of spaced through slots 70 in the inner section of the rod 64.

The combination of elements 50, frameworks 54 and bracing rods 64 thus provides an adjustable strengthening and locking mechanism for a deck 10, which spreads a load from the deck 10 to side walls of the trench.

The framework elements 50 may be formed separately from the deck 10 and attached thereto in situ by any appropriate means. The deck assembly is thereby effectively clamped to the side walls of the trench. In an alternative arrangement, the framework elements 50 may be formed integrally with the deck 10.

Referring to Fig. 6, there is shown a platform assembly 72 suitable for covering a trench to prevent accidental falling into the trench by persons or animals. This may be appropriate for applications where there is no requirement for a covering which will be in continual use. The assembly 72 comprises a lattice formed from a plurality of interconnected bars 74. Each bar 74 comprises a metal strip coated in appropriate thermosetting resin, to add strength to the assembly and

also to provide high visibility colour markings. The bars 74 are arranged in grid pattern, and are connected together at points of intersection 76 by fastenings (not shown in detail) which permit pivoting movement of respective bars 74 so that the lattice may be opened for use to the position shown in Fig. 6, or may be closed when not in use.

Each end of each bar 74 is provided with two attachment strips 78 (only some of which are shown in Fig. 6). Each strip 78 is made from a plastics material, for example polypropylene, and is attachable to an end of the respective bar 74 so that the two strips 78 at a given end of a bar 74 diverge from a common attachment point to give an arrangement of generally V shape. Each strip 78 is bonded to the pavement or road surface adjacent the mouth of the trench to be covered by means of a thermosetting polyurethane-based resin. The attachment arrangement permits the deck to flex without placing the arrangement under vertical tensile stress. When the platform is to be moved, the resin may be removed by directing a sharp blow from a suitable tool between the pavement or road surface and the resin. The resin can be cut away from the attachment strips so that the latter may be re-used. This arrangement permits fastening of the platform without damage to the pavement or road.

Fig. 7 shows an alternative attachment arrangement suitable for fastening a platform to uneven or paved ground. The arrangement comprises an anchor in the form of a wedge 80, a wire tie 82, a tensioning arrangement 84 for the wire and a strap 86. The strap 86 passes through a through aperture 88 in a deck 90, part only of which is shown in Fig. 7. The strap 86 is attached to tensile wire 82, which at its other end is formed into a loop 92 which locates around the wedge 80 and is retained in position by locating in a notch 94 on the wedge. The wedge 94 is driven into the ground adjacent the mouth of the trench, in Fig. 7 by being driven into a gap between adjacent paving slabs 96. Once the anchor arrangement is so positioned, the wire 82 is tensioned by means of a lever associated with the tensioning arrangement 84. The operation of such an arrangement is conventional and is not described here in detail. A similar attachment arrangement may be employed in areas having a solid concrete surface. In this circumstance the wedge may be driven underneath the surface layer of concrete, thus into an internal wall of the trench.

The anchor arrangement also permits flexing of the deck without putting vertical tensile stress on the attachment.

There are thus described convenient and adaptable

platform assemblies for use in a variety of situations. The decks may be securely locked in position over the trench, and are themselves strong and lightweight. The various attachment arrangements and decks described and shown may be utilised in any appropriate combination other than those specifically described herein.

Modifications may be made within the scope of the invention. The size and type of the deck may be varied according to particular requirements. The attachment means may be different from those described and shown. The channels and fixings provided for the bracing bar of the first embodiment may be provided in any convenient number, shape and configuration. The framework assembly of the second embodiment may be modified from that described and shown. The horizontal elements may be formed integrally with the deck or may be provided separately for attachment thereto.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims:-

1. A platform assembly for covering a trench, the assembly comprising means providing a deck and attachment means permitting releasable retention of the deck means to the trench in a required position.
2. A platform assembly according to Claim 1 which is collapsible.
3. A platform assembly according to Claim 1 or Claim 2 in which the deck means comprises at least one board.
4. A platform assembly according to Claim 3 in which the board is formed from a lightweight polymeric material.
5. A platform assembly according to any of the preceding Claims in which the deck means is reinforced.
6. A platform assembly according to any preceding Claims in which the deck means is provided with a non-slip surface.
7. A platform assembly according to any of the preceding Claims in which the thickness of the deck

means is tapered at each edge of the deck.

8. A platform assembly according to Claim 1 or Claim 2, wherein the deck means comprises a lattice arrangement.

9. A platform assembly according to Claim 8, wherein the lattice arrangement comprises bars pivotally interconnected so as to permit closing of the lattice when not in use.

10. A platform assembly according to Claim 8 or Claim 9, wherein bars of the lattice are formed from resin-coated metal.

11. A platform assembly accordingly to any of the preceding Claims, wherein the attachment means comprises one or more projecting peg arrangements to be driven into a respective wall of the trench.

12. A platform assembly according to Claim 11, wherein the peg arrangement extends laterally from the deck means.

13. A platform assembly according to Claim 11 or 12, wherein the location of the peg arrangement on the deck means is adjustable.

14. A platform assembly according to any of Claims 11 to 13, wherein there is provided an open channel on the deck means and a slot in the peg arrangement, fastening means for the peg arrangement being slidably engageable in the channel through the slot.
15. A platform assembly according to Claim 14, wherein there is provided a pair of spaced channels and fastening means associated with each channel cooperating with a respective slot on the peg arrangement.
16. A platform assembly according to any of the preceding Claims, wherein the deck means is adapted for the attachment to a surface thereof of one or more bracing rods.
17. A platform assembly according to any of Claims 11 to 16 including one or more bracing rods, at least one end of the or each rod projecting beyond the periphery of the deck means to define the projecting peg.
18. A platform assembly according to any of Claims 1 to 10, wherein the attachment means comprises means for clamping the deck means to walls of the trench.
19. A platform assembly according to Claim 18, wherein the clamping means spreads a load placed on the deck

means to the side walls of the trench.

20. A platform assembly according to Claim 18 or Claim 19, wherein the clamping means permits adjustment to enable it to be used for varying sizes of trench.

21. A platform assembly according to any of Claims 18 to 20 wherein the clamping means is pivotally mounted relative to the deck.

22. A platform assembly according to Claim 21, wherein means is provided for urging the clamping means against side walls of the trench.

23. A platform assembly according to Claim 22, wherein the urging means acts between the deck and the clamping means.

24. A platform assembly according to Claim 22 or Claim 23, wherein the urging means is adjustable.

25. A platform assembly according to any of Claims 22 to 24, wherein the urging means comprises a telescopically-extendable rod and means for securing the rod in a selected position.

26. A platform assembly according to Claim 25, wherein

the securing means comprises a wedge locatable through a slot in an inner part of the rod.

27. A platform assembly according to any of Claims 1 to 10, wherein the attachment means comprises at least one attachment member.

28. A platform assembly according to Claim 27, wherein there is provided attachment members extending from the deck means to extend beyond the trench on at least two substantially opposite sides thereof.

29. A platform assembly according to Claim 27 or Claim 28, wherein the attachment members are flexible.

30. A platform assembly according to any of Claims 27 to 29, wherein the attachment member comprises an attachment strip.

31. A platform assembly according to Claim 30, wherein each of a plurality of attachment points on the deck means is provided with two attachment strips diverging in a V configuration from the attachment point.

32. A platform assembly according to any of Claims 27 to 31, wherein the attachment member is releasably securable to ground adjacent the trench.

33. A platform assembly according to any of Claims 27 to 32, wherein resin is provided to secure the attachment member to the ground.

34. A platform assembly according to Claim 33, wherein the resin is a thermosetting polyurethane-based resin.

35. A platform assembly according to any of Claims 1 to 10, wherein the attachment means comprises a releasable anchor arrangement.

36. A platform assembly according to Claim 35, wherein the anchor arrangement comprises a tie and an anchor.

37. A platform assembly according to Claim 36, wherein one end of the tie is attached to the deck means and the other is secured to the ground by means of the anchor.

38. A platform assembly according to any of Claims 35 to 37, wherein the tie comprises a wire and there is further provided a tensioning arrangement for the wire.

39. A platform assembly according to Claim 38, wherein the tensioning arrangement includes a lockable lever.

40. A platform assembly according to Claim 38 or Claim 39, wherein the wire is attached to the deck means by a

strap.

41. A platform assembly according to any of Claims 36 to 40, wherein the anchor is a wedge.

42. A platform assembly according to any of Claims 1 to 10, wherein the attachment means comprises at least one expanding bolt locatable in a through aperture in the deck means.

43. A platform assembly substantially as hereinbefore described with reference to the accompanying drawings.

44. Any novel subject matter or combination including novel subject matter disclosed, whether or not within the scope of or relating to the same invention as any of the preceding Claims.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

Application number
GB 9418193.0

-21-

Relevant Technical Fields

(i) UK Cl (Ed.M) E1G

(ii) Int Cl (Ed.5) E01C (9/08); E02D (29/14); E03F (5/06)

Search Examiner
MR S CHURCH

Date of completion of Search
13 DECEMBER 1994

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASES: WPI

Documents considered relevant
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Claims :-
1 TO 43

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2267106 A (KERMONDE) whole of document	1
X	GB 2265649 A (STAGGS) whole of document but see page 4 line 3 to page 5 line 14 in particular	1, 3-8, 27 and 42
X	GB 2238815 A (BRITISH GAS) see page 3 line 31 to page 4 line 8 and page 9 lines 18 to 21 in particular	1-7, 27, 32 and 42
X	GB 1249914 A (BURGESS) whole of document	1, 3-7, 18-25, 27
	WPI Abstract Accession No 82-C2084E/09 and DE 3028805 A (BECK) 25.02.82 see abstract	1 at least

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